



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/AU86/00389 <b>(22) International Filing Date:</b> 19 December 1986 (19.12.86) <b>(31) Priority Application Number:</b> PH 3958 <b>(32) Priority Date:</b> 19 December 1985 (19.12.85) <b>(33) Priority Country:</b> AU  <b>(71) Applicant (for all designated States except US):</b> BUILT-RITE PRODUCTIONS PTY. LIMITED [AU/AU]; 70 Claremont Avenue, Greenacre, NSW 2190 (AU). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> NG, Eric [SG/AU]; 2/2 Napier Street, North Strathfield, NSW 2137 (AU). <b>(74) Agents:</b> MAXWELL, Peter, Francis et al.; Halford & Maxwell, Level 20, 44 Market Street, Sydney, NSW 2000 (AU).		<b>(81) Designated States:</b> AT (European patent), AU, BB, BE (European patent), BG, BR, CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU (European patent), MC, MG, MW, NL (European patent), NO, RO, SD, SE (European patent), SU, US.  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> REFURBISHMENT OF FIBREGLASS PANELS  <b>(57) Abstract</b> <p>A method of refurbishing a shipping container having an inner fibreglass lining that has a plurality of spaced apart outwardly projecting portions which form battens or ribs in the interior of the container which includes the step of substantially removing the projections so as to provide a substantially planar surface of the lining. A replacement panel having a plurality of spaced apart outwardly projecting portions is formed in a mould using a gelcoat having from 2 to 75% flexible resin and a fibreglass backing of from 225 to 3,000 grams per square metre. An adhesive is then applied to the planar surface and the formed panel is pressed onto the adhesive so that the spaced apart portions project into the interior of the container.</p>		

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REFURBISHMENT OF FIBREGLASS PANELSFIELD OF INVENTION

This invention relates to the refurbishment of fibreglass panels.

5           For the sake of convenience, the invention will be described in relation to the refurbishment of the fibreglass linings of shipping containers, but, it is to be understood that the invention is not limited thereto.

BACKGROUND ART

10           The fibreglass lining of a shipping container is normally adhered to a timber panel which is usually in the form of treated plywood or sandwiched timber skins. The complete inner panel consisting of the fibreglass and timber plywood is then adhered to a polyurethane insulation portion  
15           on the inside of the walls of the container.

          The fibreglass portion of the inner panel usually consist of a planar base portion having a plurality of spaced apart outwardly projecting portions which form batons or ribs that project into the interior of the container.

20           Over a period of use, the fibreglass lining crazes or cracks and becomes unsuitable for use as the cracks can harbour harmful bacteria. This presents a threatening health problem especially in the transportation of consumable goods.

          It is difficult to remove a damaged fibreglass lining as



it is securely glued to the polyurethane insulation.  
Furthermore, the wide variety of rib patterns in use  
generally prohibits use of preformed overlay panels.

It is an object of the present invention to provide an  
improved method of refurbishing fibreglass lining walls of  
shipping containers in which the original panel is not wholly  
removed from the insulation and which readily takes account  
of the wide variety of rib patterns in use.

#### DISCLOSURE OF INVENTION

According to the invention there is provided a method of  
refurbishing a fibreglass panel having a base portion and  
plurality of spaced apart outwardly projecting portions, said  
method comprising the steps of:

- (i) removing, or substantially removing, the  
projections so as to provide a substantially planar  
surface on the fibreglass panel,
- (ii) applying an adhesive to the substantially planar  
surface, and,
- (iii) positioning a replacement panel having a plurality  
of preformed spaced apart outwardly projecting  
portions onto the adhesive.

A preferred adhesive is a vinyl ester resin  
incorporating a filler and chopped fibreglass strands.

Other adhesives which may be used in cases where  
different conditions of the fibreglass surfaces are present  
include:

(i) orthophthalic, isophthalic, neopentylglycol or a combination of any of these three additive based polyester resins,

(ii) epoxy resins,

5 (iii) silicone

With either of the above resins, fillers need not be used if low viscosity of the resin is required. In some fibreglass depositor systems, lower viscosity resin is mixed with the catalyst (internally or externally) and to that  
10 mixture is added chopped fibreglass strands which come in contact with the fibreglass surface.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

According to one embodiment of the invention, the projecting portions of the fibreglass lining wall of the shipping container are removed by a diamond saw to give a  
15 substantially flat surface. Although it is preferable to remove the projecting portions in such a manner to provide a flat surface, it will be appreciated that small projections may remain or overcuts may be made.

20 The replacement panel is separately formed in a mould using a neopentylglycolisophthalic based gelcoat having from 2 to 75% flexible resin added which is then backed by 225 to 3000 grams per square meter of fibreglass wetted with a  
neopentylglycolisophthalic or isophthalic resin binder. The  
25 fibreglass can be in the form of a mat, continuous rovings or a sheet moulding compound. Various weights are used to meet

the different specifications and requirements of fibreglass linings of containers.

The adhesive is either sprayed or screened in a pattern onto the substantially planar surface of the inner wall of the container. In the case of the vinyl ester resin adhesive, the thickness can be approximately 6mm. The preformed replacement panel is pressed against the adhesive on the insulation until the adhesive is compressed to approximately 2mm in order to achieve a proper bond.

In cases where there air vents or cooling port holes in parts of containers as well as in difficult to reach areas, the refurbishment can be achieved using split strand mats and a resin binder. The surface is then finished with compatible fibreglass surface tissue. Pigmented resin or neopentylglycolisopthalic gelcoat with 0.5 to 20% wax and styrene monomer added can be used to provide the required colour and waxed surface.

Various modifications may be made in details of the process and the composition of materials used therein without departing from the scope and ambit of the invention.

CLAIMS

1. A method of refurbishing a fibreglass panel having a base and plurality of spaced apart outwardly projecting portions, said method comprising the steps of:
  - (i) removing, or substantially removing, the projections so as to provide a substantially planar surface on the fibreglass panel,
  - (ii) applying an adhesive to the substantially planar surface, and,
  - (iii) positioning a replacement panel having a plurality of spaced apart outwardly projecting portions onto the adhesive.
2. A method according to claim 1 wherein the adhesive is a vinyl ester resin incorporating a filler and chopped fibreglass strands.
3. A method according to claim 1 wherein the adhesive is selected from the group comprising:-
  - (i) orthophthalic, isophthalic or neopentylglycol additive based polyester resins or any combination thereof,
  - (ii) epoxy resins
  - (iii) silicone
4. A method according to any one of the preceding claims wherein the replacement panel is formed in a mould using a neopentylglycol isophthalic based gelcoat having from 2 to

75% flexible resin added thereto and a backing of from 225 to 3,000 grams per square meter of fibreglass.

5. A method according to claim 4 wherein the fibreglass is in the form of a mat, continuous rovings or a continuous sheet moulding compound.

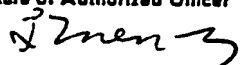
6. A method of refurbishing a shipping container having an inner fibreglass lining that has a plurality of spaced apart outwardly projecting portions which form batons or ribs in the interior of the container, said method comprising the steps of:-

- (i) substantially removing the projections so as to provide a substantially planar surface on the fibreglass lining,
- (ii) forming a replacement panel having a plurality of spaced apart outwardly projecting portions in a mould using a gelcoat having from 2 to 75% flexible resin and a fibreglass backing of from 225 to 3,000 grams per square metre,
- (iii) applying an adhesive to the planar surface and pressing the formed panel onto the adhesive with the spaced apart portions projecting into the interior of the container.



## INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 86/00389

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int. Cl. <sup>4</sup> B32B 35/00, C08J 5/12		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched ?		
Classification System	Classification Symbols	
IPC	B32B 35/00, C08J 5/12	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
AU; IPC as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages **	Relevant to Claim No. **
A	DE,A, 2758892 (CONTRANS GESELLSCHAFT FUR CONTAINERVERKEHR mbH) 5 July 1979 (05.07.79)	
A	GB,A, 2131741 (JENKINS) 27 June 1984 (27.06.84)	
A	US,A, 4430133 (GRIFFITH) 7 February 1984 (07.02.84)	
A	GB,A, 1503027 (ITAL-RUBBER SRL) 8 March 1978 (08.03.78)	
<p>* Special categories of cited documents: **</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"A" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
9 April 1987 (09.04.87)	14.4.87 (14 APRIL 1987)	
International Searching Authority	Signature of Authorized Officer	
Australian Patent Office	 L. MENZ	

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON  
INTERNATIONAL APPLICATION NO. PCT/AU 86/00389

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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Patent Document  
Cited in Search  
Report

Patent Family Members

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GB 1503027	AR 206369	AT 9398/75	AU 10097/76
	BR 7508773	CA 1078120	CH 591947
	DE 2553975	ES 445860	FR 2298429
	IL 48815	IT 1028591	JP 51093982
	NL 7515035	SE 7513550	SU 938734

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END OF ANNEX